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# Multiple mitral valve repairs in relapsing endocarditis

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## Summary

We present the case of a young woman with a history of drug abuse, who was treated for mitral valve endocarditis. Six months after a successful mitral valvuloplasty, the patient returned to hospital with relapsing endocarditis, which was treated once again with mitral repair. The strategy in this case was preferentially driven by the childbearing age of the patient. In cases of extensive destruction, it could be reasonable to proceed to a valve replacement, especially when a satisfactory repair is not achievable.

Keywords: endocarditis; mitral valve; repair; replacement; intravenous drug abuser; relapse

## Description of the case

The patient was a young woman, 28 years old, with a history of heroin and cocaine abuse.

At the time of admission she was under methadone replacement therapy. She was hospitalised because of the recent and rapid onset of migraine and fever. Blood samples identified a phlogistic state, with rising C-reactive protein levels and white blood cell count. She was started on empirical broad-spectrum antibiotic therapy with amoxicillin, vancomycin and ceftriaxone intravenously.

Blood cultures were positive for *Staphylococcus aureus*, and the antibiotic therapy was then rapidly switched to flucloxacillin. A cerebral computed tomography (CT) scan was negative for haemorrhage or pathological masses to explain her migraine symptoms. Probably because of her drug abuse, serological testing was positive for hepatitis C, but was negative for human immunodeficiency virus. Following her blood culture findings, the patient underwent transthoracic echocardiography that demonstrated the presence of a fluctuant vegetation of about 2 cm in length on the posterior leaflet of the mitral valve, responsible for mild to moderate mitral regurgitation due to posteromedial commissural erosion.

Transfer to our hospital occurred 5 days later, and on arrival a transoesophageal echocardiogram showed a 3-cm vegetation on the P3 scallop associated with partial erosion at the base of its posterior portion and a posterior paravalvular abscess close to the posteromedial commissure.

The day after, the patient underwent mitral valvuloplasty, via a trans-septal atrial approach. It was possible to resect the whole P3 involved in the endocarditic process, to debride the mitral annulus and finally replace P3 with a CorMatrix® patch. No annuloplasty ring was implanted because of the absence of underlying structural anomalies. Only a posteromedial commissuroplasty was done. The choice of a biological tissue was primarily based on the desire to avoid use of synthetic material in an infected environment, as well as on the claimed ability of CorMatrix to be gradually replaced by native tissue as it remodels. No residual mitral regurgitation was found on transoesophageal echocardiography and rapid weaning from cardiopulmonary bypass without any inotropic support was possible.

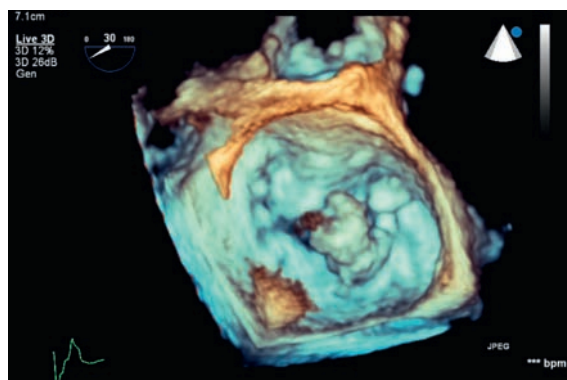
In the intensive care unit, the patient underwent rapid extubation and on postoperative day 1 she was transferred to the ward. No complications occurred during her hospital stay at our centre, and on the sixth postoperative day she was transferred to the referring hospital for 6 weeks of antibiotic therapy. At discharge the patient presented only mild residual regurgitation and a normal left ventricular ejection fraction.

The patient once at home had a relapse of her heroin and methadone abuse, and only 6 months after the first operation she complained of migraine and epileptic auras. She was then readmitted to the referring hospital where a CT scan showed cerebral and peripheral septic microemboli. A new transoesophageal cardiac ultrasound demonstrated severe mitral regurgitation due to infective endocarditis. Blood cultures were at first negative. The patient was then transferred again to our centre.

A new transthoracic ultrasound confirmed the diagnosis and showed the presence of two large vegetations on both mitral leaflets, resulting in severe mitral regurgitation. Left ventricular function was normal and the patient had no heart failure.

The patient was scheduled for reoperation the day after and, because this was a re-do operation, we proceeded to a repeat sternotomy with cannulation of the femoral artery, and of the femoral and jugular veins. Through a left atrial approach we found a large vegetation on P3

(replaced during the first operation with a CorMatrix patch) and no infection in the previous abscess cavity. We then proceeded with P3 resection, sliding of P2 and a new posteromedial commissuroplasty. Finally a Carpentier-Edwards 32 mm annuloplasty ring was implanted. Intraoperative transoesophageal ultrasound (fig. 1) showed no residual mitral regurgitation and the operation was routinely completed without any inotropic support during cardiopulmonary bypass weaning.



**Figure 1:** Intraoperative 3D transoesophageal view of the large vegetation on CorMatrix P3 during the reoperation.

The patient was weaned from mechanical ventilation in the first postoperative day and then rapidly transferred to the ward. She developed first degree atrio-ventricular block, with a negative predischARGE Holter electrocardiogram. On the seventh postoperative day the patient was transferred to the referring hospital and continued flucloxacillin for another 6 weeks. Transthoracic echocardiography at discharge showed only mild residual mitral regurgitation with a mean transvalvular pressure gradient of 6 mm Hg associated with good left ventricular function. The polymerase chain-reaction test of RNA on the valve specimen was again positive for *Staph. aureus*, confirming the diagnosis of relapsing endocarditis.

## Discussion

As reported in the recent guidelines on infective endocarditis by the European Society of Cardiology, early surgery is indicated when one or more of the following criteria are satisfied: onset of heart failure, presence of an uncontrolled infection, and need to prevent embolism [1]. Heart failure represents the most frequent and severe condition to mandate early surgery, but in this particular case heart failure was not the leading cause. Conversely, there was an abscess on the mitral annulus and a big vegetation that could provoke cerebral or peripheral embolism. After silent embolism or transient ischaemic attack, cardiac surgery, if indicated, is recommended without delay.

It is clear that in our patient the urgency was dictated by the need to avoid any possible embolisation, to have a better outcome than predicted, and to reduce valve destruction in order to make a mitral valvuloplasty more feasible [2]. Once the diagnosis has been made and the surgical approach decided, the objectives of surgery are to remove all the infected tissue and to reconstitute the normal morphology of the cardiac anatomy, by repair or replacement of the valve. Whenever possible, valve repair is preferable. The use of foreign material should be kept to a minimum. Small abscesses can be closed directly. Larger cavities should be allowed to drain into the pericardium or circulation.

Although surgery may be deferred if control of the infection by antibiotic therapy is evident in the absence of cardiac failure, early operation has been associated, in recent reports, with a repair rate of up to 80% and improved in-hospital and long-term survival. The long-term survival after an episode of infective endocarditis at the completion of the treatment, surgical and medical, is estimated to be 80 to 90% at 1 year, 70 to 80% at 2 years and 60 to 70% at 5 years. Many risk factors could influence the outcome and we can identify major risk factors (heart failure, para-annular complication and *Staph. aureus* infection) that if present together could increase the risk of death to 79% [3].

The actual risk of recurrence varies between 2 and 6%. Two main types of recurrence are distinguishable: relapse and reinfection. The former refers to a repeat episode of infective endocarditis caused by the same microorganism and, generally speaking, it presents within 6 months after the initial infection. Reinfection is caused by a different microorganism and is generally later than 6 months. It has been reported that intravenous drug abusers are more likely to develop a reinfection, and that these people are at high risk of death and need for valve replacement.

## Conclusions

Multiple repairs of a mitral valve diseased as a result of infective endocarditis is possible. In this particular case the strategy was preferentially driven by the childbearing age of the patient. In cases of extensive destruction it could be reasonable to proceed to a valve replacement, especially when a satisfactory repair is not achievable.

## Disclosure statement

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## References

The full list of references is included in the online article at [www.cardiovascmed.ch](http://www.cardiovascmed.ch)

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